



Express Mail Label No. EV 607628304 US

PATENT APPLICATION
Docket No: 11675.73.1.2.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|----------------------|----------------------------|------------|
| In re application of | |) |
| | |) |
| | Yongjun Hu |) |
| | |) |
| Serial No.: | 10/771,828 |) Art Unit |
| | |) 2818 |
| Confirmation No.: | 3960 |) |
| | |) |
| Filed: | February 4, 2004 |) |
| | |) |
| For: | PROCESS FOR FORMING A |) |
| | DIFFUSION BARRIER MATERIAL |) |
| | NITRIDE FILM |) |

INFORMATION DISCLOSURE STATEMENT
UNDER 37 C.F.R. § 1.97

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Please find, pursuant to 37 C.F.R. § 1.98(a)(1), the enclosed Form PTO-1449 which contains a list of all patents, publications, or other items that have come to the attention of one or more of the individuals designated in 37 C.F.R. § 1.56(c). While no representation is made that any of these references may be "prior art" within the meaning of that term under 35 U.S.C. §§ 102 or 103, the enclosed list of references is disclosed so as to fully comply with the duty of disclosure set forth in 37 C.F.R. § 1.56.

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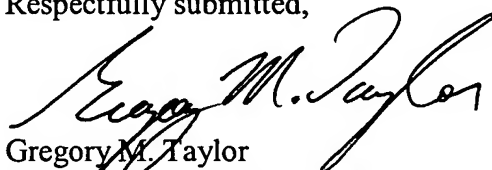
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Moreover, while no representation is made that a specific search of office files or patent office records has been conducted or that no better art exists, the undersigned attorney of record believes that the enclosed art is the closest to the claimed invention (taken in its entirety) of which the undersigned is presently aware, and no art which is closer to the claimed invention (taken in its entirety) has been knowingly withheld.

In accordance with 37 C.F.R. §§ 1.97 and 1.98, a copy of each of the listed references or relevant portion thereof that is not a U.S. Patent document is also enclosed.

DATED this 23rd day of November 2004.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Gregory M. Taylor". The signature is fluid and cursive, with the first name "Gregory" written in a larger, more prominent script than the last name "Taylor".

Gregory M. Taylor
Attorney for Applicant
Registration No. 34,263
Customer No. 022901
Telephone No. (801) 533-9800

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GPM0000000278V001



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Confirmation No.: 3960) 2818
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For: PROCESS FOR FORMING A)
DIFFUSION BARRIER MATERIAL)
NITRIDE FILM)

TRANSMITTAL FOR INFORMATION DISCLOSURE STATEMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Transmitted herewith for filing and pursuant to 37 C.F.R. § 1.97 is an Information Disclosure Statement, which includes the following statements, if any, required variously by 37 C.F.R. § 1.98:

- Statement of relevance of selected cited references not in the English language which are not translated.
- Statement that selected cited references are substantially cumulative of an enclosed or previously submitted reference.
- Statement that selected cited references were previously cited by or submitted to the United States Patent and Trademark Office in a prior application which is relied upon for an earlier filing date under 35 U.S.C. § 120.

A. Additional Materials Required Due to Content of Information Disclosure Statement

Transmitted are the following documents in addition to the Information Disclosure Statement as required variously under 37 C.F.R. § 1.98:

- ☒ Form PTO-1449 listing 24 references submitted for consideration.
- ☒ Copies of the references listed on the Form PTO-1449 that are not U.S. Patent documents.
- ☐ Copies of the following documents from the prosecution of a previous, related application:
- ☐ Form PTO-1449 AND INFORMATION DISCLOSURE STATEMENT;
and
- ☐ Form PTO-892

B. Additional Materials Required Due to Timing of Filing of Information Disclosure Statement

The transmitted Information Disclosure Statement is being filed within one (1) of the following four (4) time periods:

- I. ☐ Prior to the later of either three (3) months following the filing date or the mailing of a first Office Action. Accordingly, no materials other than those listed above are enclosed.
- II. ☒ Following the latter of either three (3) months following the filing date or the mailing of a first Office Action, but before the mailing of a final Office Action or a Notice of Allowance. Accordingly, to secure consideration thereof, one (1) of the following is also enclosed:
- ☐ Promptness Certification; or
- ☒ Credit Card Payment Form PTO-2038 in the amount of \$180.00 constituting the submission fee set forth in 37 C.F.R. § 1.17(p).
- III. ☐ After the mailing of a Notice of Allowance, but before payment of the Issue Fee. Accordingly, in order to secure consideration thereof, each of the following are also enclosed:
- ☐ Promptness Certificate;
- ☐ Petition for Consideration; and

- Check No. in the amount of \$ _____ constituting the petition fee set forth in 37 C.F.R. § 1.17(i)(1).
- IV. — After payment of the Issue Fee. Accordingly, in order to secure consideration thereof, each of the following are also enclosed:
- Petition to Withdraw from Issue; and
- Check No. _____ in the amount of \$ _____ constituting the petition fee set forth in 37 C.F.R. § 1.17(i)(1).

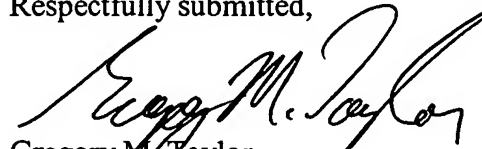
C. Fees

The Commissioner is hereby authorized to charge payment of or any deficiency in the following fees associated with this communication, or to credit any overpayment thereof, to Deposit Account No. 23-3178. A duplicate copy of this letter is enclosed.

- X Any fee required in relation to filing of this letter or any documents transmitted therewith.
- The submission fee set forth in 37 C.F.R. § 1.17(p) in the event that 37 C.F.R. § 1.97(c) applies and the Examiner is not satisfied that any Promptness Certificate submitted meets the requirements of 37 C.F.R. § 1.97(e).
- The submission fee set forth in 37 C.F.R. § 1.17(p).
- The petition fee set forth in 37 C.F.R. § 1.17(i)(1).

Dated this 23rd day of November 2004.

Respectfully submitted,



Gregory M. Taylor
Attorney for Applicant
Registration No. 34,263
Customer No. 022901
Telephone No. (801) 533-9800

Applicant: Yongjun Hu
 Serial No.: 10/771,828
 Filing Date: February 4, 2004

Confirmation No.: 3960
 Att'y Docket No.: 11675.73.1.2.1
 Group: 2818

Form PTO-1449 PROCESS FOR FORMING A DIFFUSION BARRIER MATERIAL NITRIDE FILM



INFORMATION DISCLOSURE CITATIONS MADE BY APPLICANT

U.S. Patent Documents

| <u>Examiner Initial*</u> | <u>Document Number</u> | <u>Issue Date</u> | <u>Name</u> |
|------------------------------|----------------------------|-----------------------|----------------|
| ____ 1 | 4,782,380 | 11/01/88 | Shankar et al. |
| ____ 2 | 4,847,111 | 07/11/89 | Chow et al. |
| ____ 3 | 4,897,368 | 01/30/90 | Kobushi et al. |
| ____ 4 | 4,927,505 | 05/22/90 | Sharma et al. |
| ____ 5 | 4,976,839 | 12/11/90 | Inoue |
| ____ 6 | 5,075,251 | 12/24/91 | Torres et al. |
| ____ 7 | 5,162,262 | 11/10/92 | Ajika et al. |
| ____ 8 | 5,188,979 | 02/23/93 | Filipiak |
| ____ 9 | 5,286,676 | 02/15/94 | Kruger et al. |
| ____ 10 | 5,318,924 | 06/07/94 | Lin et al. |
| ____ 11 | 5,631,479 | 05/97 | Shiga |
| ____ 12 | 5,633,200 | 05/27/97 | Hu |
| ____ 13 | 5,665,209 | 09/09/97 | Byun |
| ____ 14 | 5,688,718 | 11/18/97 | Shue |
| ____ 15 | 6,080,657 | 06/27/00 | Liu et al. |
| ____ 16 | 6,472,264 B1 | 10/29/02 | Agarwal |
| ____ 17 | 6,489,194 B1 | 12/03/02 | Agarwal |

Examiner:

Date Considered:

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609, draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Applicant: Yongjun Hu

Confirmation No.: 3960

Serial No.: 10/771,828

Att'y Docket No.: 11675.73.1.2.1

Filing Date: February 4, 2004

Group: 2818

For: PROCESS FOR FORMING A DIFFUSION BARRIER MATERIAL NITRIDE FILM

Foreign Patent Documents

| Examiner Initial* | Document Number | Publication Date | Country or Patent Office | Translation |
|----------------------|--------------------|---------------------|-----------------------------|-------------|
| _____ 18 | 3-11735 (A) | 01/21/91 | Japan | no |
| _____ 19 | 5-347274 (A) | 12/27/93 | Japan | no |

Other Documents

(including author, title, pertinent pages, etc.)

Examiner
Initial*

- _____ 20 Lin J. et al., *Aluminum Contact Filling and Planarization With Pulsed Laser*, Materials Research Society, Conference Proceedings ULSI-VII, pp. 535-540, 1992.
- _____ 21 Shingubara S. et al, *Submicron Hole Filling Characteristics Employing ECR Al Sputtering with High Magnetic Field*, Materials Research Society, Conference Proceedings ULSI-VIII, p. 257-266, 1993.
- _____ 22 Joshi R.V. et al., *Collimated Sputtering for Refractory Metal Liners for Sub-Half Micron Technology*, Materials Research Society, Conference Proceedings ULSI-VIII, pp. 273-279, 1993.
- _____ 23 Hsieh J. J. et al., *Collimated Liners: Process Modeling and Material Characteristics*, Materials Research Society, Conference Proceedings ULSI-IX, pp. 207-213, 1994.
- _____ 24 Ramaswami S. et al., *Development of a Coherent Ti/TiN Process for Sub-Half Micron Technologies*, Materials Research Society, Conference Proceedings ULSI-IX, pp. 215-221, 1994.

References Cited by Applicants

While the filing of Information Disclosure Statements is voluntary, the procedure is governed by the guidelines of Section 609 of the Manual of Patent Examining Procedure and 37 C.F.R. §§ 1.97 and 1.98. To be considered a proper Information Disclosure Statement, Form PTO-1449 shall be accompanied by a copy of each listed patent or publication or other item of information and a translation of the pertinent portions of foreign documents (if an existing translation is readily available to the applicant), an explanation of relevance of each reference not in the English language, and should be submitted in a timely manner as set out in MPEP Sec. 609.

Examiner:

Date Considered:

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609, draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Applicant: Yongjun Hu

Confirmation No.: 3960

Serial No.: 10/771,828

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Filing Date: February 4, 2004

Group: 2818

For: PROCESS FOR FORMING A DIFFUSION BARRIER MATERIAL NITRIDE FILM

Examiners will consider all citations submitted in conformance with 37 C.F.R. § 1.98 and MPEP Sec. 609 and place their initials adjacent the citations in the spaces provided on this form. Examiners will also initial citations not in conformance with the guidelines which may have been considered. A reference may be considered by the Examiner for any reason whether or not the citation is in full conformance with the guidelines. A line will be drawn through a citation if it is not in conformance with the guidelines AND has not been considered. A copy of the submitted form, as reviewed by the Examiner, will be returned to the applicant with the next communication. The original of the form will be entered into the application file.

Each citation initialed by the Examiner will be printed on the issued patent in the same manner as references cited by the Examiner on Form PTO-892.

The reference designations "A1," "A2," etc. (referring to Applicant's reference 1, Applicant's reference 2, etc.) will be used by the Examiner in the same manner as Examiner's reference designations "A," "B," "C," etc. on Office Action Form PTO-1142.

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Examiner:

Date Considered:

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609, draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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U.S. PATENT & TRADEMARK OFFICE

Docket No: 11675.73.1.2.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Yongjun Hu

10/771,828

3960

February 4, 2004

PROCESS FOR FORMING A DIFFUSION BARRIER MATERIAL NITRIDE FILM

CERTIFICATE OF EXPRESS MAIL UNDER 37 C.F.R. § 1.10

I hereby certify that the following documents are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. § 1.10 in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 23rd day of November 2004:

- Transmittal for Information Disclosure Statement
- Information Disclosure Statement
- Form PTO-1449
- Copies of references
- Credit Card Payment Form PTO-2038 for \$180.00
- Postcard

Respectfully submitted,

Gregory M. Paylor
Attorney for Applicant
Registration No. 34,263
Customer No. 022901
Telephone No. (801) 533-9800